Avneesh Mishra

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Profile

A Computer Vision and AI researcher from IIIT-H with a background in Robotics and Mechatronics engineering. Skilled at developing and deploying cutting-edge research from literature to hosting. Other skills include system administration and full-stack web development.

Areas of Experience

Computer Vision (SLAM systems, Image and video) - AI (PyTorch, TensorFlow, WandB) - Computer Science (Linux, MacOS, Windows; Docker; OS & Hardware) - Programming (Python, Bash/Shell, C++) - Frameworks (Pandas, OpenCV, Open3D, ROS)

Systems Administration (HPC, IAM, NAS, FreeIPA, Networking, Storage, Hardware) - Cloud (AWS, Linode, Runpod) - Application Development (Python, Web, Unity AR) - CI/CD Pipelines - Programming (MATLAB, Javascript, C, Swift) - Embedded Systems (Jetson, ATmega, STM32, TI, FPGAs) - CAD (Electronics: KiCAD; Mechanical: Fusion 360, SolidWorks)

Hobbies: Reading, finance, cooking

Education

M.S. by Research (CSE) *Robotics Research Center (RRC), IIIT Hyderabad* August 2021 to July 2024
CGPA 10/10

- Thesis: Foundation Models for Visual Place Recognition
- RRC Summer School 2022 - Multi-View Geometry (GitHub)
- SLAM (Simultaneous Localization and Mapping) using cameras, VPR systems, local features matching, global image descriptors.
- Group equivariant deep learning, rotation robust descriptors for feature matching
- Courses: Computer Vision, Statistical Methods in AI, and Mobile Robotics
- Student SysAdmin (from May 2022 to Feb 2023)

B.Tech. in Mechatronics Engineering *Manipal Institute of Technology* July 2016 to July 2020
CGPA 9.88/10 (Gold Medalist)

- Minor in Robotics and Artificial Intelligence
- Quarter-finalist for IICDC (DST&TI) 2018
- Technical Head of ISA (Manipal Chapter)
- Research head of RoboManipal (Robotics student project) and organized RoboWars (event) for TechTatva. Participated in RoboCon 2018.

Experience

Consultant *Hitloop, Hyderabad* July 2023 to November 2023

- Google Mediapipe and OpenMMLab solutions for detecting pose and facial landmarks.
- Dubbing use-cases for multi-lingual content creation. Lip-sync and voice cloning.

System Administrator *RRC, IIIT Hyderabad* May 2022 to Feb 2023

- Assisted in maintaining a SLURM HPC cluster with NFS, RAID, and networking components.
- Oversaw FreeIPA computing environment of RRC for simulation servers. Multi-user access and dataset storage. Developed shell scripts for report generation, user management, and HPC job scheduling.
- Assembled powerful workstations with multiple GPUs. Ensured high up-time of servers through continuous Netdata monitoring and alerts.
- Created and maintained documentation and custom scripts for RRC simulation servers and Ada HPC system.

Consultant *Artpark, RBCCPS, IISc Bangalore* March 2021 to August 2021

- Teleoperation using Asha (Sophia from Hanson Robotics) with Team Aham for the ANA Avatar XPrize challenge.
- Experience with HTC Vive (AR/VR) in Unity. Also worked with ROS (RViZ, kinematics) and Eigen.
- Teleoperation of a KUKA robotic arm and web-streaming setup to measure end-to-end latency (using USB/IP).

Student Intern *CAIR, DRDO, Bangalore* December 2019 to July 2020

- Developed a quadruped test platform (software and embedded program) to execute gaits for my end-term report.
- Kinematics and dynamics of a quadruped
- Embedded systems: CAN bus, motor control

Internship Trainee *ABB Bangalore* May 2019 to July 2019

- IRB Robots for pick & place, pelletizing, welding, and coordinate measurement. Part of industrial training
- Worked on collaborative robot YuMi and ABB RobotStudio.
- GUIs using TKinter (Python).

Research Intern *Sirena Technologies, Bangalore* May 2018 to July 2018

- First experience with computer vision, artificial intelligence, robotics (kinematics), and various software frameworks.
- Hand recognition and gesture recognition using OpenCV

Publications

- Keetha, N., **Mishra, A.**, Karhade, J., Jatavallabhula, K. M., Scherer, S., Krishna, M., & Garg, S. (2023). "Anyloc: Towards universal visual place recognition". 2023 IEEE Robotics and Automation Letters. Website, GitHub, torch.hub
- Peri, A., Mehta, K., **Mishra, A.**, Milford, M., Garg, S., & Krishna, K. M. (2022). "ReF - Rotation Equivariant Features for Local Feature Matching". arXiv preprint arXiv:2203.05206.